

**REMARKS****Status of the Claims**

Claims 10-36 are pending and elected claims 25-26 and 31-32 should be examined.

**Rejections- 35 U.S.C. § 112, First Paragraph (Written Description)****A. Claims 26 and 32**

Claims 26 and 32 are rejected for alleged lack of written description. Office Action, item 16, pages 3-4. Briefly, the PTO takes the position that the specification limits cloning orthologous genes to *Gramineae* species. Applicants respectfully traverse the grounds for this rejection.

The invention is in no way limited to cloning orthologous genes in *Gramineae* species. As indicated in the as-filed specification at, for example, paragraph [0033], the present invention contemplates identifying a nucleotide sequence conferring apomictic development in a plant, such as maize, and then using such sequence to identify orthologous genes in other apomictic plants. The specification at paragraph [0004] makes clear that apomictic plants are found in almost three hundred angiosperm species belonging to more than thirty five families. Because the specification does not limit identifying orthologous genes solely from the *Gramineae*, the skilled artisan would understand that an orthologous gene, as defined in paragraph [0021], may be identified from any plant species.

The as-filed application provides written support for nucleotide segments conferring, for example, an apomictic phenotype and methods for producing same in a plant species. For example, the application discloses molecular markers from maize and *Tripsacum* that can be used for identifying orthologous sequences in another plant species that confer apomictic development. Illustrative molecular markers include umc28, csu 68, and umc 62, as disclosed in paragraph 28 of the as-filed specification. Additionally, the as-filed application provides detailed written support for a method for using these molecular markers to identifying nucleic acid sequences conferring apomictic development. For example, the specification at paragraphs 40-47 and Example 2 discloses a method for identifying a maize nucleotide sequence orthologous to a *Tripsacum* nucleotide sequence.

Therefore, the specification provides written support for identifying a locus that cosegregates with an apomictic phenotype, cloning the corresponding polynucleotide segment, and verifying that the segment confers apomictic development by creating and analyzing a loss-of-function mutation.

For at least these reasons, the rejection is improper and should be withdrawn.

### **B. Claims 25-26 and 31-32**

Claims 25-26 and 31-32 are rejected under 35 U.S.C. § 112, first paragraph, for alleged lack of written description. Office Action, item 18, pages 6-8. Specifically, the PTO alleges “Applicant does not describe any nucleic acids encompassed by the claims, and the structural and functional features that distinguish all such nucleic acids from other nucleic acids are not provided.” *Id.* at page 6.

Contrary to the PTO’s position, applicants need not provide structural and functional features that distinguish all such nucleic acids from other nucleic acids. That is, for the purposes of satisfying the written description requirement, it is sufficient that the application provides written support for a means for identifying a nucleotide segment conferring apomictic development by using, for example, the illustrative molecular markers, to select orthologous sequences in a plant species and then verify that the orthologous sequence confers apomictic development by creating and analyzing a loss-of-function mutation in the plant species. Accordingly, the rejection is improper and should be withdrawn.

### **Rejections- 35 U.S.C. § 112, First Paragraph (Enablement)**

Claims 25-26 and 31-32 are rejected under 35 U.S.C. § 112, first paragraph, for alleged lack of enablement. Office Action, item 17, pages 4-6. Briefly, the PTO alleges that the claims are broadly drawn to cloning a nucleotide segment conferring apomixis from any plant species, yet the specification, allegedly, only provides mapping RFLP markers in *Tripsacum* and maize. Applicants respectfully traverse the grounds of this rejection.

It seems that the PTO bases its rejection on the alleged grounds that only a few RFLP markers are in the public domain. Specifically, the PTO alleges “only umc28, csu68, and

umc62 appear to be in the prior art.” Office Action, page 5. From this alleged limited number of RFLP markers, the PTO concludes “Applicant fails to provide evidence that other RFLP markers were publicly available at the time of filing.” *Id.* Additionally, it is the PTO’s position that “Applicant also fails to teach RFLP markers that identify apomixis genes other than *elongate* and *Apo*, and fails to teach transposon tagging *Apo*. *Id.*

Moreover, the PTO alleges “the instant specification fails to provide guidance for the sequences of most the RFLP markers used in the specification, or for any RFLP markers that identify other apomixis genes.” Office Action, page 5. The PTO furthers its position that the claimed invention allegedly lacks enabling support because as of the mailing date of the Final Office Action, the PTO is unaware of any published literature that describes apomixis genes cloned by the present method. That is, the PTO alleges “As of August 2006, 8.5 years after the filing of the instant application, there were no reports in the art of the cloning of any maize apomixis and diplospory genes by the claimed method or any other, indicating that the instant method is not enabled.” *Id.*

In addressing the PTO’s concern regarding the number of illustrative RFLP markers disclosed in the specification, U.S. case law makes it clear that as long as the specification discloses at least one method for making or using the claimed invention, then the claimed invention satisfies Section 112 enablement requirements. *Spectra-Physics, Inc. v. Coherent, Inc.*, 827 F.2d 1524, 1533, 3 USPQ2d 1737, 1743 (Fed. Cir.), cert. denied, 484 U.S. 954 (1987). Because the specification provides an enabling disclosure for using molecular markers from maize and/or *Tripsacum* that can be used for identifying orthologous sequences in other plant species that confer apomictic development, the specification enables the full scope of the claimed invention.

From an enablement standpoint, it is wholly irrelevant that the PTO’s literature search failed to identify any published literature that describes apomixis genes cloned by the present method. Yet, and at odds with the PTO’s enablement rejection, the PTO has identified at least two pre-filing publications that, according to the PTO, would render the present invention obvious. Thus, on one hand, the PTO urges that the prior art does not provide a methodology for identifying apomixis genes in plant species, hence, the skilled artisan would not know how

to make and use the invention. Office Action, pages 4-6. Yet, on the other hand, the PTO contends that it would have been obvious for a skilled artisan to use the alleged apomixis mutations of either Kindiger *et al.* or Leblanc *et al.* to clone apomitic genes from other plants. Office Action, pages 8-10. The PTO's position is inconsistent and constitutes an improper "squeeze play."

As discussed during a recent PTO-sponsored Biotechnology/ Chemical/ Pharmaceutical Customer Partnership Meeting, an improper squeeze occurs "when the applicant's disclosure is not commensurate with the prior art with respect to the claimed invention *i.e.*, discloses more than the prior art." See Exhibit A.: "*The Squeeze: Art and Enablement Together*, presented by Ms. Bonnie Eyler, SPE Art Unit 1646.

The PTO has "improperly squeezed" here, the PTO admits that apomixis genes are known in the art, and yet the prior art does not teach using an apomixis gene to clone gene apomixis genes from other plants. Thus, applicant's specification discloses more than the prior art. Accordingly, the state of the prior art, in conjunction with the instant application, provides guidance to the skilled artisan to make and use the claimed invention. For this reason alone, the claimed invention is enabled and the rejections should be withdrawn.

Finally, the PTO maintains its concern regarding the number of plant species tested. Office Action, page 6. In doing so, the PTO expresses doubt that other plant species would contain genes orthologous to maize apomixis and diplospory genes. While applicant need not disclose every plant species in which the claimed invention provides applicability, it is quite likely that many plant species would contain orthologous genes because apomictic plants are found in almost three hundred angiosperm species belonging to more than thirty five families. See specification, paragraph [0004]. Likewise, because most land plants are believed to have evolved from a single green alga, *Chlorocheate*, the skilled artisan would expect numerous plant species to contain orthologous genes.

For at least these reasons, the PTO's concerns are unfounded and each rejection should be withdrawn.

**Rejections- 35 U.S.C. § 103(a)****A. Rejections over Kindiger *et al.***

Claims 25-26 and 31-32 are rejected under 35 U.S.C. § 103 (a) as allegedly obvious over Kindiger *et al.* While the PTO admits that Kindiger *et al.* does not disclose transposon tagging the mutation linked to csu68, the PTO alleges that it would have been obvious to transposon tag the mutation based on Kindiger's alleged suggestion to tag genes. Office Action, pages 8-9, item 19.

Even if it were obvious to transposon tag a gene, such as csu68, Kindiger *et al.* still would not render the present invention obvious. That is, to establish a *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. MPEP § 2143.03. Because Kindiger *et al.* neither teaches nor suggests identifying and cloning a sequence conferring an apomictic phenotype by creating and analyzing a loss-of-function mutation, Kindiger *et al.* would not render the present invention obvious. Accordingly, the rejection is improper and should be withdrawn.

**B. Rejections over Leblanc *et al.***

Claims 25-26 and 31-32 are rejected under 35 U.S.C. § 103 (a) as allegedly obvious over Leblanc *et al.* Office Action, page 10, item 20. While the PTO admits that Leblanc *et al.* does not disclose cloned genes that confer apomixis development in maize or the creation of a loss-of-function mutation, the PTO alleges that it would have been obvious to clone the genes linked to the mutation.

Even if it were obvious to clone the gene, Leblanc *et al.* still would not render the present invention obvious. That is, to establish a *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. MPEP § 2143.03. Because Leblanc *et al.* neither teaches nor suggests identifying and cloning a sequence conferring an apomictic phenotype by creating and analyzing a loss-of-function mutation, Leblanc *et al.* would not render the present invention obvious. Accordingly, the rejection is improper and should be withdrawn.

## CONCLUSION

Applicants respectfully request that this Amendment under 37 C.F.R. § 1.116 be entered by the Examiner. Applicants submit that the remarks neither raise new issues nor necessitate any additional search by the Examiner, since all of the elements and their relationships claimed were either earlier claimed or inherent in the claims as examined. Therefore, this Amendment should allow for immediate action by the Examiner.

Finally, Applicants submit that entering the amendment would place the application in better form for appeal, should the Examiner dispute the patentability of the pending claims.

If there are any questions concerning this application, the examiner is invited to contact the undersigned counsel.

Respectfully submitted,

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By



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